

## RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in Charge]

By BENNETT SWENSON

*Atlantic slope drainage.*—The principal flooding during this month in this region was that in the Susquehanna River, mention of which was made in the previous issue of the REVIEW. A complete report will be made in a later issue.

Minor rises, approaching or slightly exceeding flood stage, occurred principally in the Merrimack, Connecticut, Delaware, Potomac, James, Neuse, and Roanoke Rivers. The floods were slight or moderate and no damage of consequence was reported. Rather general flooding occurred in New York State in the smaller streams from moderate to heavy rains the latter part of March which caused the melting of a moderately heavy snow cover.

The following report is submitted by the official in charge, Concord, N. H., relative to the rise in the Merrimack River Basin:

Ice in the river began to break up on March 30, and had entirely disappeared by the end of the first week in April. Stages began to rise above the normal winter low on April 2, reaching and slightly passing flood stages on the 13th and 14th, in the central section of the Merrimack Basin.

A sharp increase occurred in stages on the main river from Franklin to Lawrence on April 12 due to an average 1½ inch rainfall in that reach of the river. A considerable rise occurred in the Contoocook River, where a large amount of snow melted. However, in the area of heavy accumulated snow (the Pemigewasset River) the amount of run-off was negligible, due to continued moderately low temperatures.

As the river was quite swollen before the rain of April 12 began, and as the amount that fell was considerable, a serious freshet would have occurred, except for the fact that a sharp freeze followed the storm. The rapid retardation of the run-off after the passage of the cold front was phenomenal.

Considerable valley storage below Manchester, combined with the fact that there was practically no snow in the lower tributaries, prevented the Merrimack from reaching flood stages in the lower reaches.

*East Gulf of Mexico drainage.*—The Apalachicola River reached flood stage at Blountstown, Fla., on April 8 and remained above that stage until the 12th, but no appreciable damage occurred.

Moderate flooding prevailed in portions of the Black Warrior and Tombigbee Rivers during most of the month from frequent heavy rains. Damage was slight except in the Tombigbee north of Aberdeen, Miss., where 90,000 acres of land were inundated with a loss estimated at \$700,000, mostly to prospective crops.

Above flood stages were registered in the Pearl River at Jackson, Miss., and Pearl River, La., with only slight losses due to suspension of business.

## MISSISSIPPI SYSTEM

*Upper Mississippi Basin.*—The following is reported by the Official in Charge, La Crosse, Wis., relative to a rise in the Chippewa River and the Mississippi in the vicinity of La Crosse:

Cautionary warnings were issued on April 11 for a 10-foot stage (flood stage 11 feet) at Durand, Wis., for the 13th. A hard freeze with temperatures ranging from 12° to 15° above in northern Wisconsin occurred on the 12th resulting in an abrupt checking of surface run-off from melting snow. Crest at Durand did not exceed 7.5 feet for this reason.

Crest stages from melting snow this month in the Mississippi River closely agreed with the results of the snow survey made the latter part of February. The date of the crest of high water in the lower section of the district was forecast the first of April to occur between the 15th and 18th. The actual crest of 7.8 feet occurred at La Crosse on the 18th. This is the lowest crest stage with surface run-off from melting snow since the Spring of 1931.

As was stated in the snow survey, the unusually dry condition in the fall of 1939 was responsible for a high percentage of initial loss into the soil, and together with periods of unseasonably cold weather held in check any extensive surface run-off.

*Missouri Basin.*—Heavy rains in eastern South Dakota, southwestern Minnesota, and western Iowa, caused high water in the Big Sioux River from April 1 to 8, at Akron, Iowa, and a day later near Sioux City, Iowa. Overflow was confined to low ground along the river and no damage of consequence occurred.

Flooded creeks in the vicinity of Chinook, Mont., on April 20, inundated several hundred acres of farm land and caused property damage estimated at \$2,700.

*Ohio Basin.*—Flooding occurred quite generally in the Ohio Basin, extending from the latter part of March in the upper portion, to May in the lower portion. A complete report will be included in the next issue of the REVIEW.

*White Basin.*—Heavy rains on April 12 and 13 resulted in flood stages on the Black and White Rivers in Missouri and Arkansas. The flooding continued into May in the lower portions. The greatest damage reported was in the upper White with a loss to prospective crops amounting to \$10,000.

*Red Basin.*—Slight flooding occurred in the Sulphur River at Ringo Crossing and Naples, Tex., from April 6 to 18. No damage of consequence was reported.

*Lower Mississippi Basin.*—The report from the Memphis river district office relative to floods in the St. Francis River follows:

As a result of a heavy rainfall in the headwaters of the St. Francis River, on April 11, warnings were issued for flood stages at Fisk, Mo., and St. Francis, Ark. Owing to additional moderately heavy rainfall on the 18th, and on the 19th in the upper basin, warnings were revised.

At Fisk, Mo., the river crested at 23.0 feet on April 14 and, after a fall of a few days, again crested at 23.4 feet on April 22, although the 24-hour rise on the 22d was only 0.1 foot. The heavy rainfall that occurred on the 18th and 19th gave a stage of 19.9 feet at St. Francis, on the 19th. The river continued to rise at St. Francis, with the exception of no change on the 21st, and crested at a stage of 20.9 feet on the 25th.

The Mississippi rose quite rapidly in the early part of the month and on April 10th a crest stage of 22.4 feet was reached on the 13th at Memphis, Tenn.

Another rise started at Memphis on the 20th, which reached 29.9 feet at the end of the month and was still rising.

*West Gulf of Mexico drainage.*—Moderate overflows occurred from the Trinity River at Trinidad, Tex., from April 10 to 16, with a crest stage of 31.0 feet on the 12th. No appreciable loss was reported but, due to timely warnings, it has been estimated that movable property and livestock valued at \$15,000 were saved.

*Pacific slope drainage.*—A second major flood occurred in the Sacramento River within a month's time from the first. The Sacramento, Calif., office reports as follows:

## FLOODS IN THE SACRAMENTO AND SAN JOAQUIN VALLEYS MARCH 29-APRIL 6, 1940

E. H. FLETCHER

[Weather Bureau, Sacramento, Calif., June 1940]

Following the major flood in the Sacramento Valley at the beginning of March, there was a period of about three weeks when no appreciable precipitation occurred, although the same general tendency for low-pressure areas to move far southward in the ocean persisted.

An occluded front, in connection with an extensive field of low pressure off the north Pacific coast, reached the coast line of Wash-